without defining the scope or type of molecular weight being employed.

Claims 1-12 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,162,441 to Nakata et al ("Nakata") in view of U.S. Patent No. 5,686,529 to Srinivasan et al ("Srinivasan").

Claims 1-16 remain pending in the application.

REMARKS

The Office Action mailed November 20, 2002 has been given careful consideration by the Applicants. Reconsideration of the application is hereby respectfully requested in view of the above amendments and the following comments.

The graph on page 2 has been removed and replaced with Figure 1. Claims 1, 4, 5, 6, 7, 15 and 16 have been amended to delete the use of the terms "high molecular weight" and "low molecular weight." As such, the Applicants submit that the claims are now clear and particularly point out and distinctly claim the subject matter which applicants regard as their invention as required under 35 U.S.C. §112, second paragraph. Applicants respectfully request withdrawal of this rejection. The Examiner rejected claims 1-16 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,162,441 to Nakata et al ("Nakata") in view of U.S. Patent No. 5,686,529 to Srinivasan et al ("Srinivasan"). Applicants respectfully disagree that the claims of the present invention are anticipated by or obvious over Nakata in view of Srinivasan.

Nakata discloses a vulcanizable rubber blend comprising a mixture of high Mooney viscosity and low Mooney viscosity EPDM rubbers. The first or high Mooney viscosity EPDM rubber has an ethylene content of 45 - 59% by weight and a Mooney viscosity (MLI+a 100°C) of 35 - 55 (col. 3, lines 4-7). The second or low Mooney EPDM has the same ethylene content and a Mooney viscosity (ML1+a 100°C) of 5 to 25 (col. 3, lines 45-48).

Srinivasan discloses thermoplastic olefin compositions including a crystalline or semi-crystalline polyolefin, a first ethylene-propylene rubber having a high molecular weight and a second ethylene-propylene rubber having a relatively low molecular weight. The crystalline or semi-crystalline polyolefin can include polypropylene as well as copolymers of polypropylene and ethylene. The first rubber component preferably has a Mooney viscosity (MLI+2 100°C) of between 10 and 120 and the second rubber preferably has a number average molecular weight

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of between 1,000 and 10,000 (col. 2, lines 22-25; abstract). For at least the reasons below, the disclosure of Nakata taken in view of Srinivasan fails to render the present claims unpatentable under §103(a).

First, there is no motivation to combine the two references. To establish a prima facie case of obviousness, there must be some suggestion or motivation to combine the referenced teachings. Here, there is no motivation to combine the two references. The Examiner has failed to meet his burden of providing some suggestion of the desirability of combining the teachings of the two references to support the conclusion that the claimed invention is directed to obvious subject matter. To satisfy this burden, either the references must expressly or impliedly suggest the claimed invention or the Examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings and the references. MPEP §2142.

The Examiner attempts to support his combining of the two references by stating that "it would have been obvious since both references are drawn to EPDM blends useful for molded articles." This is incorrect. As discussed, Nakata is drawn to vulcanized rubber blends having excellent mechanical properties for use in such applications as seals for hydraulic systems. These blends are thus thermoset compositions. On the other hand, Srinivasan is drawn to thermoplastic olefin compositions having improved fluid resistance for improving the adherence of these compositions for paints. Thus, not only are these two references drawn to completely different subject matter (i.e. a thermoset rubber blend and a thermoplastic olefin composition), they also seek to solve completely different problems. That is, Nakata seeks to improve the mechanical properties or rubber blends used in seals, while Srinivasan seeks to improve the adherence qualities of thermoplastic olefin compositions for paints.

Even assuming, for the purposes of argument, that the two references are both drawn to the same subject matter and field of application, this does not satisfy the Examiner's burden of providing some suggestion of the desirability of combining the two references. The simple fact that two references are in the same field of invention does not satisfy this requirement.

Second, even if the references could some how be combined, they would still not disclose all of the recitations of the present claims. Specifically, neither Nakata nor Srinivasan disclose the first and second EPDM rubbers of th present claims. Claims 1 and 15, from which the remainder of the rejected claims ultimately

depend, recite a polymer blend containing a first EPDM rubber containing a Mooney viscosity (ML (1+8) at 150°C) of from about 20 to about 40, conjugated diene rubber, and a second EPDM rubber having a Mooney viscosity (ML (1+4) at 125°C) of from about 13 to about 27. The EPDM rubbers disclosed in Nakata and Srinivasan do not have the claimed viscosity. For example, in Nakata, the first or high Mooney EPDM rubber has a Mooney viscosity of (ML, -4 100°C) of 35 to 55, while the second or low Mooney EPDM has a Mooney viscosity of (ML1+a 100°C) of 5 to 25. While the naked viscosity values may be overlapping between the two, a comparison of these values is not possible due to the differences under which the viscosity measurements were made. The Examiner is referred to ASTM D1646 (a copy of which is enclosed herewith). As explained on page 6 of ASTM D1646, not only were the Mooney viscosities in Nakata and the present application taken at different temperatures, they were also taken at different times after the motor on the viscometer was started. As indicated in paragraph 8.3 of ASTM D1646, the viscosity obtained for a given specimen will vary depending on the manner in which the specimen is prepared and the conditions of rest prior to the test. Thus, it cannot be said that Nakata discloses the use of EPDM rubbers having the same viscosities as claimed in the present invention.

The same analysis applies to the EPDM rubbers disclsoed in Srinivasan. The Mooney viscosity provided fgor the first rubber componenet in Srinivasan was taken at a different temperature (100°C) and at a different waiteing period (2 minutes) then the EPDM rubbers of the present invention. The Examiner has simply no basis for stating that the EPDM rubbers of Srinivasan are the same as those claimed in the present invention. In addition, the Examiner states that "the lower Mooney viscosity value for the low number average molecular weight copolymer would have been inherent based on the molecular weight." The Examiner has no basis for making this statement. As stated in paragraph 5.1, on page 2 of the ASTM D1646 "viscosity values determined by this test method depending on molecular structure, molecular mass, and non-rubber constituents that may be present. Since rubber behaves as a non-Newtonian fluid, no simple relationship exists between the molecular mass and the viscosity." Thus, it is simply impossible for the Examiner to conclude that the second rubber componenet of Srinivasan, having an average molecular wight of betwe n 1,000 and 10,000, would inherently have the claimed Mooney viscosity of the present invention.

With regard to claim 7, Nakata teaches away from an EPDM rubber

having an ethylene content of from about 75 to about 85% by weight, a di ne content of about 5% to about 10% by weight, and a bimdal molecular wight distribution. Nakata specifically states that "the ethylene content of the sub-EPDM is preferably close to that of the main EPDM" (col. 3, lines 45-47). The ethylene content of the main EPDM in Nakata cannot exceed 59% by wight since a higher ethylene content would lower the low temperature r4esistance of the resulting rubber (col. 3, line 20-21). With regard to claim 14, neither Nakata nor Srinivasan disclose a cure system having the claimed combination of curing additives in the claimed concentration.

For at least these reasons, neither Nakata nor Srinivasan either alone or in combination discloses or suggests any of claims 1-16.

CONCLUSION

In view of the forgoing, the Applicants submit that claims 1-16 are in condition for allowance. Applicants respectfully request early notification of such allowance. Should any issues remain unresolved, the Examiner is encouraged to contact the undersigned to attempt to resolve any such issues. If any fee is due in conjunction with the filing of this Amendment and response, Applicants authorize deduction of that fee from Deposit Account 06-0308.

Respectfully submitted,

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2/3/03
DATED

Attachment: Version with Markings to Show Changes Made.

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

Please replace the paragraph starting on page 2, line 6 with the followingnew paragraph:

Styrene-butadiene rubber (SBR) is a diene rubber that is often considered a candidate for blending with EPDM. It is low in cost and relatively easy to process. Unfortunately, SBR, along with most other diene rubbers, are immiscible in EPDM and exhibit cure incompatibility with EPDM. This cure incompatibility of EPDM and highly unsaturated diene rubbers is demonstrated by the poor performance of the resulting composition in stress-strain tests. In addition, SBR does not tolerate high levels of carbon black and oil incorporation, showing a sharp decrease in its physical properties when even moderately high levels of filler are added. Figure 1 [The following graph] shows the tensile strengths of EPDM/SBR blends at high carbon black and oil loadings as a function of the concentration of the individual elastomers.

Please delete the graph following the paragraph starting on pg. 2, line 6.

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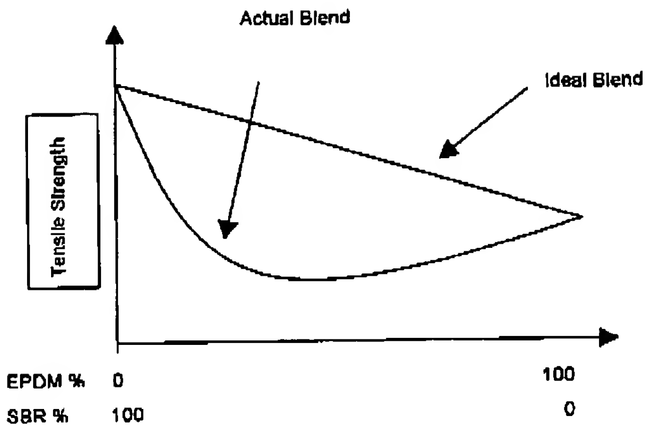

Please add the following prior to "DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS:"

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a graph of the tensile strengths of EPDM/SRR blends as a function of the concentration of the individual elastomers. Please add FIGURE 1 to the application.

IN THE CLAIMS:

1. (Amended) A polymer blend adapted to replace unblended EPDM, said polymer blend comprising:

a [high molecular weight] first EPDM rubber having a Mooney viscosity (ML (1+8) at 150°C) of from about 20 to about 40;

a conjugated diene rubber; and

a [low molecular weight] second EPDM rubber having a Mooney viscosity (ML (1+4) at 125°C) of from about 13 to about 27.

4. (Amended) The polymer blend of claim 1, wherein said polymer blend comprises about 60 phr to about 120 phr of said [high molecular weight] first EPDM rubber, about 10 phr to about 40 phr of said conjugated diene rubber and about 25 phr to about 45 phr of said [low molecular weight] second EPDM rubber.

5. (Amended) The polymer blend of claim 1, wherein said [high molecular weight] first EPDM rubber is an oil-extended EPDM rubber.

6. (Amended) The polymer blend of claim 5, wherein said [high molecular weight] first EPDM rubber has an ethylene content of about 58% to about 68% by weight of EPDM, a diene content of about 8.0% to about 11.5% by weight of EPDM and an oil content of about 45% to about 55% by total weight of the rubber.

7. (Amended) The polymer blend of claim 1, wherein said [low molecular weight] second EPDM rubber has an ethylene content of about 75% to about 85% by weight, a diene content of about 5% to about 10% by weight and a bimodal molecular . weight distribution.

15. (Amended) A polymer blend comprising:

an oil extended [high molecular weight] first EPDM rubber having a Mooney viscosity (ML (1+8) at 150°C) of from about 20 to about 40, an ethylene content of about 58% to about 68% by weight of EPDM, a diene content of about 8.0% to about 11.5% by weight of EPDM and an oil content of about 45% to about 55% by total weight of said rubber;

a styrene-butadiene rubber;

a [low molecular weight] second EPDM rubber having a Mooney viscosity (ML (1+4)at 125°C) of from about 13 to about 27, an ethylene content of about 75% to about 85% by weight, a diene content of about 5% to about 10% by weight and a bimodal molecular weight distribution;

about 120 to about 200 phr carbon black; about 70 to about 100 phr oil; and

a cure system comprising a combination of sulfur/tetramethylthiuram disulfide/dipentamethylenethiuram tetrasulfide/zinc dibutyldithiocarbamate/2-mercaptobenzothiazolate disulfide/N-t-butylbenzothiazole-2-sulfanimide in a phr concentration of about 1.7/0.5/1.0/0.2/2.0/1.5.

16. (Amended) A polymer blend according to claim 15, wherein said blend contains about 90 phr of said oil extended [high molecular weight] first EPDM,

about 35 phr of said styrene-butadiene rubber, about 35 phr of said [low molecular weight]second EPDM, about 160 phr of said carbon black and about 80 phr of said oil.